6-1-1989

Test 1625: John Deere 8960 Powersync Diesel 12 and 24-Speed

Tractor Museum
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NEBRASKA OECD TRACTOR TEST 1625—SUMMARY 063
JOHN DEERE 8960 POWRSYNC DIESEL
24 SPEED ALSO 12 SPEED

POWER TAKE-OFF PERFORMANCE

Power HP *(kW)*	Crank shaft speed rpm	Gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION					
Rated Engine Speed—(PTO speed—1002 rpm)					
333.40 *(248.61)*	1900	19.52 *(73.88)*	0.405 *(0.246)*	17.08 *(3.36)*	
Maximum Power (2 Hours)					
335.34 *(250.06)*	1800	19.24 *(72.84)*	0.397 *(0.241)*	17.43 *(3.43)*	
VARYING POWER AND FUEL CONSUMPTION					
333.40 *(248.61)*	1900	19.52 *(73.88)*	0.405 *(0.246)*	17.08 *(3.36)*	Air temperature
300.45 *(224.05)*	2016	18.62 *(70.48)*	0.428 *(0.261)*	16.14 *(3.18)*	77°F *(25°C)*
230.06 *(171.56)*	2059	15.41 *(58.33)*	0.463 *(0.282)*	14.93 *(2.94)*	Relative humidity
155.12 *(115.67)*	2077	11.50 *(43.54)*	0.513 *(0.312)*	13.49 *(2.66)*	22%
78.21 *(58.32)*	2099	8.72 *(33.02)*	0.771 *(0.469)*	8.97 *(1.77)*	Barometer
0.54 *(0.40)*	2139	5.30 *(20.04)*	68.105 *(41.427)*	0.10 *(0.02)*	29.08" Hg *(98.48 kPa)*

Maximum Torque 1268 lb.-ft *(1719 Nm)* at 1248 rpm
Maximum Torque Rise 37.6%
Torque Rise at 1000 engine rpm 28%

DRAWBAR PERFORMANCE
FUEL CONSUMPTION CHARACTERISTICS

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	Temp.°F *(°C)* cool-ing med	Temp.°F *(°C)* Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Power—10th (B3) Gear									
308.26 *(229.87)*	19700 *(87.63)*	5.87 *(9.44)*	1898	2.22	0.431 *(0.262)*	16.03 *(3.16)*	186 *(86)*	68 *(20)*	28.92 *(97.93)*
75% of Pull at Maximum Power—10th (B3) Gear									
250.39 *(186.71)*	14792 *(65.80)*	6.35 *(10.22)*	2044	1.86	0.485 *(0.295)*	14.26 *(2.81)*	186 *(86)*	77 *(25)*	28.84 *(97.66)*
50% of Pull at Maximum Power—10th (B3) Gear									
170.33 *(127.02)*	9851 *(43.82)*	6.48 *(10.44)*	2075	1.22	0.551 *(0.335)*	12.55 *(2.47)*	181 *(83)*	77 *(25)*	28.82 *(97.60)*
75% of Pull at Reduced Engine Speed—13th (B4) Gear									
249.73 *(186.22)*	14765 *(65.68)*	6.34 *(10.21)*	1703	1.68	0.432 *(0.263)*	16.01 *(3.15)*	186 *(86)*	77 *(25)*	28.84 *(97.66)*
50% of Pull at Reduced Engine Speed—13th (B4) Gear									
170.63 *(127.24)*	9859 *(43.86)*	6.49 *(10.45)*	1732	1.31	0.488 *(0.297)*	14.16 *(2.79)*	182 *(83)*	79 *(26)*	28.81 *(97.56)*

Location of Test: Center for Agricultural Equipment, Lincoln Nebraska 68583-0832, U.S.A.

Dates of Test: May-June, 1989

Manufacturer: John Deere Waterloo Works, P.O. Box 3500, Waterloo, Iowa 50704

FUEL OIL and TIME: Fuel No. 2 Diesel **Cetane No.** 51.1 **Specific gravity converted to 60°/60°F *(15°/15°C)*** 0.8301 **Fuel weight** 6.912 lbs/gal *(0.828 kg/l)* **Oil SAE** 15W40 **API service classification** CD/SD **To motor** 7.757 gal *(29.362 l)* **Drained from motor** 7.249 gal *(27.442 l)* **Transmission, hydraulic and final drive lubricant** John Deere HyGard fluid **Total time engine was operated** 31.5 hours.

ENGINE: Make Cummins Diesel **Type** six cylinder vertical with turbocharger and intercooler **Serial No.** 11511016 **Crankshaft** lengthwise **Rated engine speed** 1900 **Bore and stroke** (as specified) 5.50" × 6.00" *(139.7 mm × 152.4 mm)* **Compression ratio** 14.0 to 1 **Displacement** 855 cu in *(14011 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and aspirator **Oil filter** two full flow cartridges **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper cartridge **Fuel cooler** radiator for injection pump return fuel **Muffler** vertical **Cooling medium temperature control** one thermostat and variable speed fan.

ENGINE OPERATING PARAMETERS: Fuel rate 130.2-142.1 lb/hr *(59.0-64.5 kg/hr)* **High idle** 2080-2180 rpm **Turbo boost** nominal 19-23 psi *(131-159 kPa)* as measured 21.5 psi *(148 kPa)*.

CHASSIS: Type four wheel drive with duals **Serial No.** *RW8960H001019* **Tread width** rear 78.8" *(2002 mm)* to 144.1" *(3659 mm)* front 78.8" *(2002 mm)* to 144.1" *(3659 mm)* **Wheel base** 133.9" *(3400 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with partial (2) range operator controlled powershift **Nominal travel speeds mph *(km/h)*** first 2.19 *(3.53)* second 2.63 *(4.23)* third 2.82 *(4.54)* fourth 3.38 *(5.45)* fifth 3.86 *(6.22)* sixth 4.63 *(7.45)* seventh 4.67 *(7.52)* eighth 5.15 *(8.29)* ninth 5.60 *(9.01)* tenth 6.01 *(9.68)* eleventh 6.18 *(9.94)* twelfth 6.63 *(10.67)* thirteenth 7.21 *(11.60)* fourteenth 7.95 *(12.79)* fifteenth 8.23 *(13.25)* sixteenth 9.08 *(14.60)* seventeenth 9.87 *(15.89)* eighteenth 10.88 *(17.51)* nineteenth 10.97 *(17.66)* twentieth 13.16 *(21.18)* twenty-first 14.13 *(22.77)* twenty-second 16.95 *(27.27)* twenty-third 19.34 *(31.12)* twenty-fourth 23.19 *(37.32)* reverse 2.63 *(4.23)*, 3.15 *(5.07)*, 5.60 *(9.01)*, 6.18 *(9.94)*, 6.72 *(10.81)*, 7.41 *(11.92)* **Clutch** multiple wet disc hydraulically power actuated by foot pedal **Brakes** multiple wet disc hydraulically

DRAWBAR PERFORMANCE AT 1800 RPM
MAXIMUM POWER IN SELECTED GEARS

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp.°F *(°C)* cool-ing med	Air dry bulb	Barom. inch Hg *(kPa)*
				4th (A4) Gear					
278.85 *(207.94)*	34462 *(153.29)*	3.03 *(4.88)*	1883	9.25	0.472 *(0.287)*	14.64 *(2.88)*	186 *(85)*	69 *(21)*	28.94 *(98.00)*
				5th (A5) Gear					
286.38 *(213.56)*	30187 *(134.28)*	3.56 *(5.73)*	1861	5.87	0.456 *(0.277)*	15.16 *(2.99)*	186 *(86)*	73 *(23)*	28.92 *(97.93)*
				6th (A6) Gear					
293.96 *(219.21)*	26288 *(116.93)*	4.19 *(6.75)*	1799	4.34	0.442 *(0.269)*	15.63 *(3.08)*	187 *(86)*	76 *(24)*	28.92 *(97.93)*
				7th (B1) Gear					
301.53 *(224.85)*	26611 *(118.37)*	4.25 *(6.84)*	1800	3.90	0.432 *(0.263)*	16.02 *(3.16)*	186 *(85)*	70 *(21)*	28.87 *(97.77)*
				8th (C1) Gear					
300.12 *(223.80)*	23972 *(106.63)*	4.69 *(7.56)*	1796	3.47	0.434 *(0.264)*	15.94 *(3.14)*	187 *(86)*	76 *(24)*	28.80 *(97.53)*
				9th (B2) Gear					
304.72 *(227.23)*	22208 *(98.78)*	5.15 *(8.28)*	1800	3.02	0.427 *(0.260)*	16.18 *(3.19)*	190 *(88)*	76 *(24)*	28.81 *(97.56)*
				10th (B3) Gear					
310.49 *(231.53)*	20988 *(93.36)*	5.55 *(8.93)*	1799	2.49	0.423 *(0.257)*	16.35 *(3.22)*	188 *(86)*	68 *(20)*	28.92 *(97.93)*
				11th (C2) Gear					
301.82 *(225.06)*	19858 *(88.33)*	5.70 *(9.17)*	1800	2.49	0.429 *(0.261)*	16.12 *(3.18)*	187 *(86)*	70 *(21)*	28.88 *(97.80)*
				12th (C3) Gear					
307.52 *(229.31)*	18772 *(83.50)*	6.14 *(9.89)*	1803	2.22	0.423 *(0.257)*	16.34 *(3.22)*	187 *(86)*	72 *(22)*	28.87 *(97.77)*
				13th (B4) Gear					
305.09 *(227.51)*	17080 *(75.98)*	6.70 *(10.78)*	1803	2.04	0.425 *(0.259)*	16.25 *(3.20)*	188 *(87)*	73 *(23)*	28.85 *(97.70)*
				14th (C4) Gear					
305.04 *(227.47)*	15482 *(68.87)*	7.39 *(11.89)*	1799	1.86	0.427 *(0.260)*	16.18 *(3.19)*	190 *(88)*	74 *(23)*	28.84 *(97.66)*
				15th (B5) Gear					
306.49 *(228.55)*	14986 *(66.66)*	7.67 *(12.34)*	1802	1.68	0.425 *(0.259)*	16.25 *(3.20)*	188 *(87)*	74 *(23)*	28.83 *(97.63)*
				16th (C5) Gear					
304.70 *(227.21)*	13481 *(59.96)*	8.48 *(13.64)*	1803	1.49	0.427 *(0.260)*	16.17 *(3.19)*	188 *(87)*	76 *(24)*	28.82 *(97.60)*

power actuated by foot pedal **Steering** hydrostatic and articulated **Power take-off** 1003 rpm at 1900 engine rpm **Unladen tractor mass** 35570 lb *(16134 kg)*.

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. For the maximum power tests, the fuel temperature at the injection pump inlet was maintained at 102° F *(39° C)*. This tractor is equipped with a variable speed cooling fan. Since engine power is influenced by fan speed, all power tests were conducted at approximately the same ambient air temperatures. The pull in 3rd (A3) and 4th (A4) gears was limited to avoid tractor bouncing. The performance figures on this summary were taken from a test conducted under the OECD restricted standard test code procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1625,** Summary 063, December 22, 1989.

LOUIS I. LEVITICUS
Engineer-in-Charge

K. VON BARGEN
R. D. GRISSO
G. J. HOFFMAN
Board of Tractor Test Engineers

DRAWBAR PERFORMANCE AT 1900 RPM
MAXIMUM POWER IN SELECTED GEARS

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp.°F *(°C)* cool-ing med	Air dry bulb	Barom. inch Hg *(kPa)*
				3rd (A3) Gear					
248.00 *(184.93)*	34316 *(152.64)*	2.71 *(4.36)*	2025	9.87	0.500 *(0.304)*	13.83 *(2.72)*	185 *(85)*	70 *(21)*	28.93 *(97.97)*
				4th (A4) Gear					
281.10 *(209.62)*	33574 *(149.34)*	3.14 *(5.05)*	1898	7.02	0.471 *(0.286)*	14.69 *(2.89)*	186 *(85)*	64 *(18)*	28.94 *(98.00)*
				5th (A5) Gear					
287.55 *(214.43)*	29577 *(131.57)*	3.65 *(5.87)*	1898	5.45	0.465 *(0.283)*	14.88 *(2.93)*	186 *(85)*	71 *(22)*	28.93 *(97.97)*
				6th (A6) Gear					
293.06 *(218.53)*	24764 *(110.16)*	4.44 *(7.14)*	1895	3.82	0.453 *(0.276)*	15.25 *(3.00)*	187 *(86)*	73 *(23)*	28.92 *(97.93)*
				7th (B1) Gear					
303.49 *(226.31)*	25262 *(112.37)*	4.51 *(7.25)*	1898	3.47	0.440 *(0.267)*	15.72 *(3.10)*	186 *(85)*	74 *(23)*	28.86 *(97.73)*
				8th (C1) Gear					
299.47 *(223.31)*	22541 *(100.27)*	4.98 *(8.02)*	1899	3.20	0.444 *(0.270)*	15.58 *(3.07)*	187 *(86)*	77 *(25)*	28.80 *(97.53)*
				9th (B2) Gear					
302.33 *(225.45)*	20826 *(92.64)*	5.44 *(8.76)*	1897	2.49	0.439 *(0.267)*	15.74 *(3.10)*	187 *(86)*	68 *(20)*	28.91 *(97.90)*
				10th (B3) Gear					
308.26 *(229.87)*	19700 *(87.63)*	5.87 *(9.44)*	1898	2.22	0.431 *(0.262)*	16.03 *(3.16)*	186 *(86)*	68 *(20)*	28.92 *(97.93)*
				11th (C2) Gear					
298.67 *(222.72)*	18552 *(82.52)*	6.04 *(9.72)*	1901	2.13	0.444 *(0.270)*	15.57 *(3.07)*	187 *(86)*	70 *(21)*	28.89 *(97.83)*
				12th (C3) Gear					
301.98 *(225.19)*	17472 *(77.72)*	6.48 *(10.43)*	1898	2.13	0.437 *(0.266)*	15.80 *(3.11)*	187 *(86)*	72 *(22)*	28.86 *(97.73)*
				13th (B4) Gear					
298.20 *(222.37)*	15815 *(70.35)*	7.07 *(11.38)*	1900	1.77	0.444 *(0.270)*	15.55 *(3.06)*	187 *(86)*	74 *(23)*	28.84 *(97.66)*
				14th (C4) Gear					
299.52 *(223.36)*	14369 *(63.92)*	7.82 *(12.58)*	1901	1.68	0.444 *(0.270)*	15.58 *(3.07)*	187 *(86)*	74 *(23)*	28.83 *(97.63)*
				15th (B5) Gear					
300.37 *(223.98)*	13922 *(61.93)*	8.09 *(13.02)*	1898	1.49	0.442 *(0.269)*	15.63 *(3.08)*	187 *(86)*	74 *(23)*	28.82 *(97.60)*

TRACTOR SOUND LEVEL WITH CAB	**dB(A)**
Gear closest to 4.7 mph *(7.5 km/h)*—7th (B1) Gear	74.0
Maximum sound level	77.0
Transport speed—no load—24th (D6) Gear	75.0
Bystander in 24th (D6) Gear	87.0

LUGGING ABILITY IN 12th (C3) GEAR

Crankshaft Speed rpm	1898	1712	1519	1333	1134	951
Pull—lbs *(kN)*	17472 *(77.72)*	19540 *(86.92)*	21692 *(96.49)*	23689 *(105.37)*	24113 *(107.26)*	22134 *(98.46)*
Increase in Pull %	0	12	24	36	38	27
Power—Hp *(kW)*	301.98 *(225.19)*	303.58 *(226.38)*	297.66 *(221.97)*	283.81 *(211.64)*	245.38 *(182.98)*	189.64 *(141.42)*
Speed—Mph *(km/h)*	6.48 *(10.43)*	5.83 *(9.38)*	5.15 *(8.28)*	4.49 *(7.23)*	3.82 *(6.14)*	3.21 *(5.17)*
Slip %	2.13	2.58	2.76	3.29	3.47	3.11

THREE POINT HITCH PERFORMANCE (SAE Static Test)

Observed Maximum Pressure psi. *(bar)*	2540 *(175)*
Location	remote outlet
Hydraulic oil temperature °F*(°C)*	137 *(58)*
Location	hydraulic sump
Category	IV
Quick attach	Yes

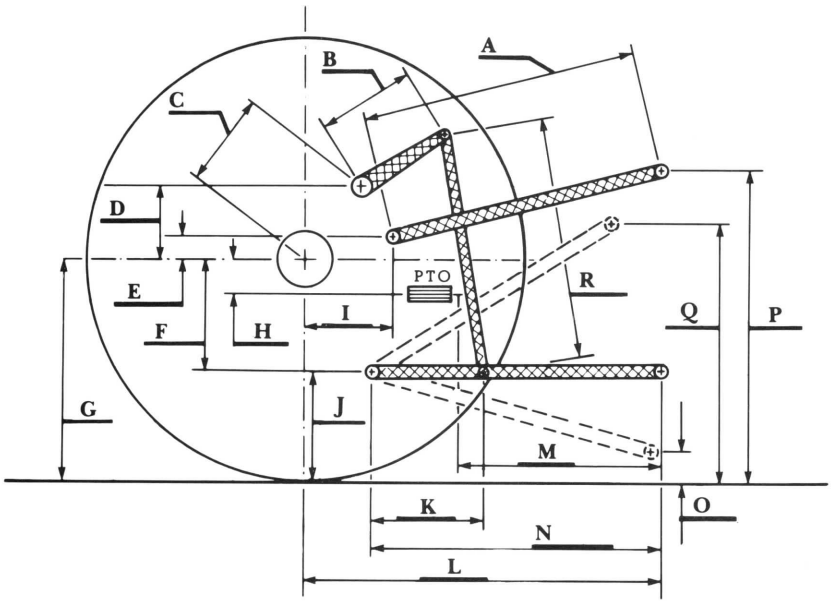
Hitch point distance to ground level in. *(mm)*	9.0 *(229)*	16.2 *(411)*	26.4 *(670)*	38.4 *(975)*	46.0 *(1168)*
Lift force on frame lb. " " " " " " *(kN)*	15978 *(71.1)*	16368 *(72.8)*	16514 *(73.5)*	15334 *(68.2)*	13968 *(62.1)*

TIRES AND WEIGHT		Tested Without Ballast
Rear Tires	—No., size, ply & psi *(kPa)*	Four 20.8R42; **; 14 *(95)*
Front Tires	—No., size, ply & psi *(kPa)*	Four 20.8R42; **; 14 *(95)*
Height of Drawbar		20.0 in *(510 mm)*
Static Weight	—Rear	15730 lb *(7135 kg)*
	—Front	19840 lb *(8999 kg)*
	—Total	35570 lb *(16134 kg)*

THREE POINT HITCH PERFORMANCE (OECD Static Test)

CATEGORY: IV
Quick Attach: Yes

Maximum Force Exerted Through Whole Range:	12009 lbs *(53.4 kN)*
i) Opening pressure of relief valve:	NA
Sustained pressure with pump stalled:	2540 psi *(175 Bar)*
ii) Pump delivery rate at minimum pressure:	39.9 GPM *(151.0 l/min)*
iii) Pump delivery rate at maximum hydraulic power:	38.2 GPM *(144.6 l/min)*
Delivery pressure:	1950 psi *(134 Bar)*
Power:	43.5 Hp *(32.4 kW)*



HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	*mm*
A	31.0	*787*
B	18.6	*472*
C	26.2	*666*
D	24.4	*620*
E	11.3	*288*
F	13.8	*350*
G	36.1	*918*
H	4.8	*122*
I	22.7	*577*
J	22.3	*568*
K	28.3	*718*
L	54.5	*1385*
L′	60.5	*1537*
M	24.6	*625*
N	43.2	*1097*
O	8.9	*226*
P	49.3	*1254*
Q	40.9	*1039*
R	44.6	*1133*

L′ to end of Quick attach

John Deere 8960 Powrsync Diesel

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